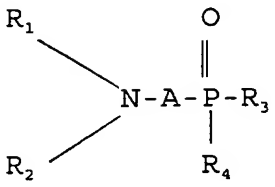
Claims

1. Use of organophosphorus compounds of the general formula (I)

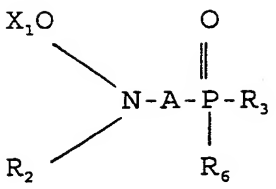


(I)

in which R_1 and R_2 are the same or different and are selected from the group which consists of hydrogen, substituted and unsubstituted alkyl, substituted and unsubstituted hydroxyalkyl, substituted and unsubstituted alkenyl, substituted and unsubstituted alkinyl, substituted and unsubstituted aryl, substituted and unsubstituted acyl, substituted and unsubstituted cycloalkyl, substituted and unsubstituted aralkyl, substituted and unsubstituted heterocyclic radical, halogen, OX_1 and OX_2,
wherein X_1 and X_2 may be the same or different and are selected from the group which consists of hydrogen, substituted and unsubstituted alkyl, substituted and unsubstituted hydroxyalkyl, substituted and unsubstituted alkenyl, substituted and unsubstituted alkinyl, substituted and unsubstituted aryl, substituted and unsubstituted acyl, substituted and unsubstituted cycloalkyl, substituted and unsubstituted aralkyl, substituted and unsubstituted heterocyclic radical,
A is selected from the group which consists of an alkylene radical, an alkenylene radical and a hydroxyalkylene radical,
R_3 and R_4 are selected independently from the group which consists of hydrogen, substituted and unsubstituted alkyl, substituted and unsubstituted hydroxyalkyl, substituted and unsubstituted aryl, substituted and unsubstituted acyl, substituted and unsubstituted aralkyl, substituted and

unsubstituted alkenyl, substituted and unsubstituted alkinyl, substituted and unsubstituted cycloalkyl, substituted and unsubstituted heterocyclic radical, halogen, OX_3 and OX_4, R_3 and R_4 are selected independently from the group which consists of hydrogen, substituted and unsubstituted C_{1-26}-alkyl, substituted and unsubstituted hydroxy-C_{1-26}-alkyl, substituted and unsubstituted aryl, substituted and unsubstituted acyl, substituted and unsubstituted aralkyl, substituted and unsubstituted C_{1-26}-alkenyl, substituted and unsubstituted C_{1-26}-alkinyl, substituted and unsubstituted cycloalkyl, substituted and unsubstituted heterocyclic radical, halogen, OX_3 and OX_4, wherein X_3 and X_4 are selected independently from the group which consists of hydrogen, substituted and unsubstituted C_{1-26}-alkyl, substituted and unsubstituted hydroxyl-C_{1-26}-alkyl, substituted and unsubstituted aryl, substituted and unsubstituted aralkyl, substituted and unsubstituted C_{1-26}-alkenyl, substituted and unsubstituted C_{1-26}-alkinyl, substituted and unsubstituted cycloalkyl, substituted and unsubstituted heterocyclic radical, a silyl, a cation of an organic and inorganic base, in particular a metal of the first, second or third main group of the periodic system, ammonium, substituted ammonium and ammonium compounds which derive from ethylene diamine or amino acids,
and their pharmaceutically acceptable salts, esters and salts of esters or else compounds which upon application provide the compounds to be used according to the invention as metabolic products or decomposition products in order to produce a pharmaceutical composition for therapeutic and prophylactic treatment of infections in humans and animals caused by parasites, fungi and viruses.

2. Use according to claim 1, characterised in that the organophosphorus compounds correspond to Formula (II),



(II)

wherein,
X_1 is selected from the group which consists of hydrogen, substituted or unsubstituted acyl, substituted or unsubstituted alkyl, substituted or unsubstituted aryl, substituted or unsubstituted aralkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted heterocyclic radical.

3. Use according to claim 2, characterised in that R_2 is an acyl radical, preferably an alkanoyl radical and particularly preferably a formyl or acetyl radical.

4. Use according to one of the preceding claims, R_3 and R_4 are selected independently from the group which consists of hydrogen, methyl, ethyl, OX_3 and OX_4, wherein X_3 and X_4 are selected independently from the group which consists of hydrogen, sodium, potassium, methyl and ethyl.

5. Use according to one of the preceding claims, characterised in that between the phosphorus atom and the nitrogen atom A forms a chain of three carbon atoms, preferably a propylene, propenylene or hydroxypropylene chain.

6. Use according to claim 1 or 2, characterised in that R_4 represents OX_4 and X_4 is selected from the group which consists of hydrogen, ammonium and metals of the first and second main group of the periodic system, preferably sodium, potassium, calcium or magnesium, ammonium compounds which derive from ethylenediamine or amino acids, preferably ethanolamine, ethylenediamine, N,N-dibenzylethylenediamine and arginine.

7. Use according to one of the preceding claims for the treatment of infections which are caused by viruses selected from the group which consists of viruses of the genus parvoviridae, in particular parvo viruses, dependo viruses, denso viruses, viruses of the adenoviridae genus, in particular adeno viruses, mastadeno viruses, aviadeno viruses, viruses of the genus papovaviridae, in particular papova viruses, in particular papilloma viruses (so called wart viruses), polyoma viruses, in particular JC-virus, BK-virus and miopapova viruses, viruses of the genus herpesviridae, in particular herpes simplex viruses, of the varicella-zoster viruses, human cytomegalo virus, Epstein-Barr viruses, human herpes virus 6, human herpes virus 7, human herpes virus 8, viruses of the genus poxviridae, in particular pox viruses, orthopox, parapox, molluscum contagiosum virus, avipox viruses, capripox viruses, leporipox viruses, primary hepatotropic viruses, in particular hepatitis viruses, such as hepatitis A viruses, hepatitis B viruses, hepatitis C viruses, hepatitis D viruses, hepatitis E viruses, hepatitis F viruses, hepatitis G viruses, hepadna viruses, in particular all hepatitis viruses, such as hepatitis B virus, hepatitis D viruses, viruses of the genus picornaviridae, in particular picorna viruses, all entero viruses, all polio viruses, all coxsackie viruses, all echo viruses, all rhino viruses, hepatitis A virus, aphtho viruses, viruses of the genus calciviridae, in particular hepatitis E viruses, viruses of the genus reoviridae, in particular reo viruses, orbi viruses, rota viruses, viruses of the genus togaviridae, in particular toga viruses, alpha viruses, rubi viruses, pestiviruses, rubella virus, viruses of the genus flaviviridae, in particular flavi viruses, ESME virus, hepatitis C virus, viruses of the genus orthomyxoviridae, in particular influenza viruses, viruses of the genus paramyxoviridae, in particular paramyxo viruses, morbilli virus, pneumo virus, measles virus, mumps virus, viruses of the genus rhabdoviridae, in particular rhabdo viruses, rabies virus, lyssa virus, viscula stomatitis virus, viruses of the

genus coronaviridae, in particular corona viruses, viruses of the genus bunyaviridae, in particular bunya viruses, nairo virus, phlebo virus, uuku virus, hanta virus, hantaan virus, viruses of the genus arenaviridae, in particular arena viruses, lymphocytic choriomeningitis virus, viruses of the genus retroviridae, in particular retro viruses, all HTL viruses, human T-cell leukaemia virus, oncorna viruses, spuma viruses, lenti viruses, all HI viruses, viruses of the genus filoviridae in particular Marburg and Ebola virus, slow viruses, prions, oncoviruses and leukaemia viruses.

8. Use according to one of the preceding claims for the prevention and treatment of infections caused by unicellular parasites namely pathogens of malaria, sleeping sickness, Chagas' disease, toxoplasmosis, amoebic dysentery, leishmaniasis, trichomoniasis, pneumocystosis, balantidiasis, cryptosporidiasis, sarcocystosis, acanthamebiasis, naegleriasis, coccidiosis, giardiasis and lambliosis.

9. Use according to one of claims 1 to 8 in a pharmaceutical preparation which has an active content of at least one organophosphorus compound and a pharmaceutically acceptable carrier.

10. Use according to claim 9, characterised in that the pharmaceutical preparation has at least one further pharmaceutical active ingredient, in particular sulphonamide, sulfadoxine, artemisinin, atovaquon, quinine, chloroquine, hydroxychloroquine, mefloquine, halofantrine, pyrimethamine, armesin, tetracyclines, doxycycline, proguanil, metronidazole, praziquantel, niclosamide, mebendazol, pyrantel, tiabendazol, diethylcarbazine, piperazine, pyrivinum, metrifonate, oxamniquine, bithionol or suramin.

11. Use according to claim 10, characterised by one or more components of the group which consists of benzyl penicillin

(Penicillin G), phenoxy penicillins, isoxazolyl penicillins, amino penicillins, ampicillin, amoxicillin, bacampicillin, carboxy penicillin, ticarcillin, temocillin, acyalamino pencillins, azlocillin, mezlocillin, piperacillin, apalcillin, mecillinam, cephalosporins, cefazolin group, cefuroxime group, cefoxitin group, cefoxitin, cefotetan, cefmetazole, latamoxef, flomoxef, cefotaxime group, cefozidime, ceftazidime groups, ceftazidime, cefpirom, cefepim, other cephalosporins, cefsulodine, cefoperazone, oralcephalosporins of the cefalexine group, laracarbef, cefprozil, new oralcephalosporins with expanded spectrum, cefixime, cefpodoxim proxetil, cefuroxime axetil, cefetamet, cefotiam hexetil, cefdinir, ceftibutene, other β-lactam antibiotics, carbapenem, imipenem/cilastatin, meropenem, biapenem, aztreonam, β-lactamase inhibitors, calvulanic acid/ amoxicillin, calvulanic acid/ticarcillin, sulbactam/ampicillin, tazobactam/piperacillin, tetracyclines, oxytetracycline, roli-tetracycline, doxycycline, minocycline, chloramphenicol, amino-glycosides, gentamicin, tobramycin, netilmicin, amikacin, spectinomyxin, macrolides, erythromycin, clarithromycin, roxithromycin, azithromycin, dirithromycin, spiramycin, josamycin, lincosamides, clindamycin, fusidic acid, glycopeptide antibiotics, vancomycin, tecoplanin, pristinamycin derivates, fosfomycin, antimicrobial folic acid antagonists, sulphonamides, co-trimoxazole, trimethoprim, other diaminopyrimidine-sulphonamide combinations, nitrofurans, nitrofurantoin, nitrofurazone, Gyrase inhibitors (quinolones), norflaxacin, ciproflaxacin, ofloxacin, sparfloxacin, enoxacin, fleroxacin, pefloxacin, lomefloxacin, Bay Y3118, nitroimidazoles, antimycobacterial agents, isoniazid, rifampicin, rifabutin, ethambutol, pyrazinamide, streptomycin, capreomycin, prothionamide, terizidon, dapsone, clofazimine, topical antibiotics, bacitracin, tyrothricin, polymyxins, neomycin, kanamycin, paromomycin, mupirocin, antiviral agents, acyclovir, ganciclovir, azidothymidine, didanosin, zalcitabin, thiacytidine, stavudine, ribavirin, idoxuridine, trifluridine,

foscarnet, amantadine, interferons, tibol derivatives, proteinase inhibitors, antifungal agents, polyenes, amphotericin B, nystatin, natamycin, azoles, azoles for septic treatment, miconazole, ketoconazole, itraconazole, fluconazole, UK-109.496, azoles for topical application, clotrimazole, econazole, isoconazole, oxiconazole, bifonazole, flucytosine, griseofulvin, ciclopiroxolamine, tolnaftate, naftifine, terbinafine, amorolfine, anthraquinones, betulinic acid, semianthraquinones, xanthones, napthtoquinones, aryaminoalcohols, quinine, quini-dines, mefloquine, halofantrine, chloroquine, amodiaquine, acridine, benzonaphthyridine, mepacrine, pyronaridine, dapsone, sulphonamide, sulfadoxine, sulfalenes, trimethoprim, proguanil, chlorproguanil, diaminopyrimidine, pyrimethamine, primaquine, aminoquinolines, WR 238,605, tetracycline, doxycyline, clindamycin, norfloxacin, ciprofloxacin, ofloxacin, artemisinin, dihydroartemisinin, 10b arte mether, arte ether, arte sunate, atovaquon, suramin, melarsoprol, nifurtimox, stibogluconate-sodium, pentamidine, amphotericin B, metronidazole, clioquinol, mebendazole, niclosamide, praziquantel, pyrantel, tiabendazole, diethylcarbamazine, ivermectin, bithionol, oxamniquine, metrifonate, piperazine, embonate.